

Application No.: 10/565,534
Arndt. Dated June 10, 2008
Reply to Office Action of March 11, 2008

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A position/force control device, comprising[[;]] :

- (i) position detection means for detecting the a position of an object;
- (ii) driving means for driving the said object;
- (iii) reaction force detection means for estimating a reaction force which the object receives, where the reaction force is detected indirectly based on the basis of a position signal outputted from the said position detection means and a driving signal applied to the driving means; and
- (iv) control means for estimating calculating a first acceleration signal from the reaction force which the object undergoes and the a goal force signal, and further estimating calculating a second acceleration signal from the position signal and the a goal position, and outputting the a generated driving signal to said driving means, the generated driving signal being based on the basis of said first and second acceleration signals.

Claim 2 (currently amended): A position/force control device for controlling the a position of the an object and force on the object in response to position command signals and force command signals, comprising [[;]] :

- (i) driving means for driving the said object;
- (ii) position detection means for detecting a position of the object;
- (iii) reaction force detection means for estimating the a reaction force undergone by the object, where the reaction force is detected indirectly based on from an acceleration signal estimated from a position signal outputted by from the position detection means and from a driving signal transmitted applied to the driving means;
- (iv) first calculation means for estimating calculating a deviation difference between a position command signal and a position signal outputted by the position detection means and converting the deviation difference signal to a first acceleration signal;

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(v) second calculation means for estimating calculating a deviation second difference between the reaction force detected by the reaction force detection means and a force command signal and converting the second deviation difference signal to a second acceleration signal; and

(vi) control means for adding the said first and second acceleration signals and outputting the a generated driving signal to the driving means, the generated driving signal being based on said first and second acceleration signals.

Claim 3 (currently amended): A position/force control device for controlling positions of an object on a slave side and of an operation part on a master side in response to a position difference between the operation part on the master side and the object on the slave side to drive the object with driving force in response to the an operation force on the master side and transmit the a reaction force of the slave side to the master side, comprising[[;]] :

- (i) first driving means for driving the operation part on the master side;
- (ii) first position detection means for detecting the a first position of the operation part on the master side;
- (iii) first reaction force detection means for estimating a first reaction force acted on the said operation part, where the first reaction force is indirectly detected based on from an acceleration signal estimated from a first position signal outputted by from the first position detection means and from the a first driving signal transmitted applied to the said first driving means;
- (iv) second driving means for driving the object on the slave side;
- (v) second position detection means for detecting the a second position of the object on the slave side;
- (vi) second reaction force detection means for estimating the a second reaction force undergone by the object, where the second reaction force is indirectly detected based on from an acceleration signal estimated from the a second position signal outputted by from the said second position detection means and from the a second driving signal transmitted applied to the said second driving means;

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- (vii) first calculation means for estimating calculating a difference between the first position signal outputted by the said first position detection means and the second position signal outputted by the said second position detection means and converting the said difference to the first and second acceleration control signals for controlling the master side and the slave side;
- (viii) second calculation means for estimating calculating the a sum of outputs of said the first and the second reaction force detection means, and converting the said sum to the third and fourth acceleration control signals for controlling the master side and the slave side;
- (ix) first addition means for adding the said first and the third acceleration control signals;
- (x) second addition means for adding the said second and the fourth acceleration control signals;
- (xi) first control means for outputting the a first generated driving signal to the operation part on the master side based on the basis of the an output of the said first addition means; and
- (xii) second control means for outputting a second generated driving signal to the object on the slave side based on the basis of an output of the said second addition means.